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AMENDMENT TO THE DRAWINGS

Figure 6 is amended by adding the legend "PRIOR ART" adjacent the figure number.

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REMARKS

Claims 2, 3, and 28-30 are now pending in the application. Claims 2 and 3 have been amended to more particularly define the invention. Claims 28-30 have been added to assure Applicant the degree of protection to which his invention entitles him. Claims 1 and 4-27 have been cancelled in the interest of expediting prosecution.

THE DRAWINGS

The Office Action contends that Figures 5 and 6 of the drawings should be designated by a legend such as - - Prior Art - - and requires corrected drawings with such a legend. A corrected Figure 6, having this legend, is submitted herewith. Insofar as Figure 5 is concerned, this contention and requirement are traversed.

The paragraph commencing at page 1, line 5, states that the present invention relates to a mobile communication system which has a function of broadcasting or multicasting service data to a plurality of radio terminals. A description of prior art commences at page 1, line 15 and starts by describing a service for broadcasting or multicasting large volume data to a plurality of radio terminals. That paragraph then describes Figure 5 as a system for performing such a service. Thus, Figure 5 relates to the present invention, as well as to the prior art.

At page 7, line 11, Figure 5 is described as a schematic diagram of a mobile communication system to which the present invention is applied.

In describing a radio network controller in the embodiments of the present invention, the paragraph commencing at page 7, line 15 states that “. . . UE 20 moves between RNCs in

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the system diagram of FIG. 5.” and that the notification unit 40 is “for . . . following the movement of the UE 20 between the RNCs shown in FIG. 5, . . .”

The paragraph commencing at page 8, line 19 states that the sequence diagram of Figure 2 “shows an operation sequence among the UE 20, the moving destination RNC 5, and the moving source RNC 4 shown in FIG. 5.” The paragraph commencing at page 9, line 24 says the same thing about Figure 3, while the paragraph commencing at page 10, line 16 says the same thing about Figure 4. Figures 2, 3, and 4 relate to the present invention.

It is accordingly submitted that, while Figure 5 does relate to prior art, it likewise relates to the present invention, and so it should not be designated as “PRIOR ART,” since that would tell the viewer that Figure 5 only pertains to prior art, and implies that Figure 5 does not pertain to the claimed invention. Accordingly, as to Figure 5, the requirement should be withdrawn.

THE SPECIFICATION

The Office Action objects to the specification due to a misspelling at page 11, line 21. This has been corrected by the above amendments. An identical misspelling has been corrected at page 9, line 21.

The Office Action objects that the brief descriptions of Figures 5 and 6 do not indicate that those figures relate to known materials. This has been corrected as to Figure 6. As set forth above with regard to the drawings, such a correction would not be appropriate as to Figure 5, and so the requirement should be withdrawn as to that figure.

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CLAIM OBJECTION

The Office Action objected to claim 1 due to a purported lack of transition language. The cancellation of claim 1 has made this objection moot.

CLAIM REJECTION UNDER 35 U.S.C. §101

The Office Action rejected claim 27 under 35 U.S.C. §101 as directed to non-statutory subject matter. The Office Action included a suggestion for overcoming this rejection. The courtesy of the Examiner in providing such suggestion is appreciated. Claim 27 has been canceled and replaced by claim 30 which incorporates the suggestion.

CLAIM REJECTIONS UNDER 35 U.S.C. §103(a)

Claims 1-27 were rejected under 35 U.S.C. 103(a) as being unpatentable over Sarkkinen et al., U.S. Patent No. 6,701,155 in view of Ericsson, UK Patent No. 2 371 179 A. In the interest of expediting prosecution, claims 1 and 4-27 have been canceled and replaced by claims 28-30. Claims 27-30 combine subject matter from some of the original claims, including claims 4, 5, 8, and 9. Claims 2 and 3 have been amended to be dependent from claim 28. Insofar as the rejection may be deemed to apply to claims 2, 3, or 28-30, the rejection is traversed.

The claimed invention is directed to a mobile communication system, a method of operating a mobile communication system, and a computer readable medium having stored thereon a program for causing a computer to execute an operation control method for a mobile communication system. In accordance with exemplary embodiments of the invention,

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the mobile communication system delivers identical data from a data source to a plurality of radio terminals. The mobile communication system includes a plurality of radio network controllers. Each controller maintains a count of the number of radio terminals connected to such controller to receive the data from the data source and controls delivery of the data within an associated cell. A radio terminal within a first cell is connected to the controller associated with the first cell. Upon movement of the radio terminal from the first cell to a second cell, the radio terminal is connected to the controller associated with the second cell, and the count of radio terminals connected to the controller associated with the first cell is decremented, while the count of radio terminals connected to the controller associated with the second cell is incremented. The number of radio terminals connected to the controller associated with the second cell is compared with a predetermined number. If the number of radio terminals connected to the controller associated with the second cell is less than the predetermined number, a dedicated channel is set between the radio terminal and the controller associated with the second cell, but if the number of radio terminals connected to the controller associated with the second cell is equal to or greater than the predetermined number, a common channel is set between the radio terminal and the controller associated with the second cell. The data is delivered from the controller associated with the second cell to the radio terminal over the set channel.

In rejecting original claims 4 and 5, the Office Action contends that decrementing or incrementing the count of radio terminals after the radio terminal has moved from the first cell to the second cell is shown by Sarkkinen at column 6, lines 12 to 35 and column 7, lines 48-58. This contention, and the rejection based on it, are traversed.

Column 6, lines 12-35 of Sarkkinen read:

“After receiving information from the RNC, the SGSN may determine (from the multicast table) if any changes have occurred. These changes may include multicast UEs moving to a new multicast area or new services/group ids are indicated by the RNC. That is, the SGSN may get notified of a new address or of a new identification of the multicast service. The SGSN may act accordingly by updating the database based on the indicated situation in the RNC.

“FIG. 4 illustrates an example of the UTRAN sending an update message to the SGSN according to an example embodiment of the present invention. Other embodiments are also within the scope of the present invention. The RNC (such as the RNC 140) may send an update message to the SGSN (such as the SGSN 120) when the RNC notices a change in the multicast information indicated from the UEs. The RNC may also send this information periodically. This change may be, for example, a new multicast UE in its multicast area cells. The update message may include information of new multicast service/multicast groups, information about multicast UE identity, and/or a number of new UEs for each multicast service/group. Other information may also be communicated. After receiving the update message, the SGSN may update the multicast related database.”

This passage states that user equipment (“UEs”) might have moved to a new multicast area and that the serving GPRS support nodes (“SGSN”) may get notified of a new address and may update the database. The radio network controller (“RNC”) may send an update message to the SGSN, and the update message may include information of new multicast service, multicast groups, information about multicast UE identity, and/or a number of new UEs for each multicast service/group. However, nowhere does this passage teach or suggest decrementing or incrementing the count of radio terminals after the radio terminal has moved from the first cell to the second cell.

Column 7, lines 48-58 of Sarkkinen read:

“As shown in blocks 208-211, after receiving a response from the GGSN/MBMS-SC the SGSN may start the RAB assignment process by sending a Multicast RAB assignment request to the RNC. On the other hand, if

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the number of authorized UEs is very low, then a normal RAB assignment request may be sent in order to establish point-to-point connection between the SGSN and the UE. The RNC may check the radio resource situation on the air interface and reserve resources from the UTRAN and the air interface. The lu interface may be configured to support user plane multicast data transmission over the lu interface.”

This passage states that the RNC may check the radio resource situation and reserve resources, but, again, nowhere does this passage teach or suggest decrementing or incrementing the count of radio terminals after the radio terminal has moved from the first cell to the second cell.

In fact, column 9, lines 6-10 of Sarkkinen read:

“Identification of the UEs may be obtained from the cells by paging the UEs using enhanced paging procedures in which the paging response contains the UE identification based on which point-to-point connection may be established.”

Rather than incrementing or decrementing counts, Sarkkinen teaches that to determine when radio terminals are within a cell, the radio terminals should be paged.

It is accordingly submitted that this passage of Sarkkinen does not provide a proper basis for rejecting the claims of the present application.

In rejecting original claims 8 and 9, the Office Action contends that the moving destination radio network controller comparing the updated number and a predetermined number, and setting either a dedicated channel or a common channel based on the comparison is shown by Sarkkinen at column 8, line 49 to column 9, line 40. This contention, and the rejection based on it, are traversed.

Column 8, line 49 to column 9, line 40 of Sarkkinen read:

“Point-to-point connection and point-to-multipoint connection will now be described. Based on the multicast database in the SGSN, the SGSN

may route multicast sessions to the proper RNCs having UEs that are able to receive certain multicast services or that are members of certain multicast groups. In this way, the use of multicast related radio resources on the UTRAN side may be optimized when the data is sent only via the radio interfaces under which the potential listeners are known to exist.

“To make the system more efficient from the air interface point of view, the SGSN may define whether it requests (for the "multicast RAB") either the point-to-point connection or the point-to-multipoint connection. The point-to-point connection may be efficient when the number of service users in a cell is very high. The point-to-point connection may be considered when the number of specific multicast service subscribers is very low (i.e., only a few subscribers per cell). In order to make this evaluation in the SGSN, the SGSN should be aware of the number or different service subscribers or multicast groups members in a cell. The SGSN may obtain this information from the RNC to maintain the database based on information received from the UEs in a cell or when the point-to-point connection is appropriate for the multicast data transmission based on a low number of authorized UEs in a cell. Identification of the UEs may be obtained from the cells by paging the UEs using enhanced paging procedures in which the paging response contains the UE identification based on which point-to-point connection may be established. More specifically, the page is sent to the UEs by using identification (e.g., multicast IMSI) that identifies the service or a multicast group but not the subscriber or the UE itself. As a response, the UE may send back actual UE identification on which the network may establish the required point-to-point connection.

“The UE amount information may be obtained from the RNC either by using the periodic status request procedure, the UTRAN initiated information update procedure or triggering based status inquiry. After receiving the information, the SGSN may determine whether the indicated service subscriber number for the new service is so low that rather than using the point-to-multipoint connection, the multicast service may be sent [*sic.* set] using specific point-to-point connections. When the point-to-point connection is selected, rather than requesting "multicast RAB" from the RNC, the SGSN may start the normal RAB assignment procedure to initialize the reservation of the dedicated resources for each multicast service authorized UEs in a cell. In the UTRAN, initialization of the point-to-point connection does not differ from procedures defined for the NRT/RT packet data services in 3GPP.

“Embodiments of the present invention may provide a method (in a CN) to activate a multicast or broadcast PDP context between a MBMS-SC/GGSN and a RNC. Multicast or broadcast PDP context activation may include checking whether there are users in the UTRAN, whether the users are

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allowed to receive the multicast or broadcast data, and creating a GTP tunnel. UEs authorized to receive the service may be configured to receive the data over an air interface before the actual session starts.”

This passage states that point-to-point connection may be efficient when the number of service users in a cell is very high and may be considered when the number of specific multicast service subscribers is very low, but this does not teach or suggest a moving destination radio network controller comparing the updated number and a predetermined number, and setting either a dedicated channel or a common channel based on the comparison.

The passage also states that the SGSN may determine whether the indicated service subscriber number for the new service is so low that rather than using the point-to-multipoint connection, the multicast service may be set using specific point-to-point connections. However, this does not teach or suggest a moving destination radio network controller comparing an updated number and a predetermined number, and setting either a dedicated channel or a common channel based on the comparison.

It is accordingly submitted that this passage of Sarkkinen does not provide a proper basis for rejecting the claims of the present application.

CONCLUSION

In view of the foregoing, Applicant submits that claims 2, 3, and 28-30, all the claims presently pending in the application, are patentably distinct over the prior art of record and are allowable, and that the application is in condition for allowance. Such action would be appreciated.

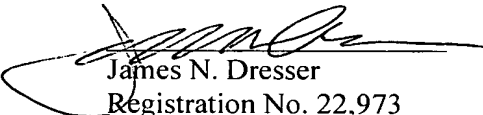
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Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned attorney at the local telephone number listed below to discuss any other changes deemed necessary for allowance in a telephonic or personal interview.

To the extent necessary, Applicant petitions for an extension of time under 37 CFR §1.136. The Commissioner is authorized to charge any deficiency in fees, including extension of time fees, or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

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FIG.6
(PRIOR ART)

